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LAROSE, COLIN M	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/944,941	Applicant(s) MOTOSU ET AL.	
	Examiner Colin M. LaRose	Art Unit 2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-16 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-16 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 6.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 6, 8, and 10 objected to because of the following informalities:

Claims 6, 8, and 10 recite performing some action "every macroblock" and/or "every the macroblock". These grammatical mistakes should be changed to "for every macroblock."

Appropriate correction is required.

2. The following sections of 37 CFR §1.75(a) and (d)(1) are the basis of the following objection:

> (a) The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.
>
> (d)(1) The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description.

3. Claim 6 is objected to under 37 CFR §1.75(a) and (d)(1) as failing to particularly point out and distinctly claim the subject matter that the applicant regards as the invention.

Claim 6 recties that, "in the first time," "the quantization scale" is used. Then, the claim recites that, "in the second time," "the quantization scale" is used, and it further refers to "the quantization scale used … in the second time."

It appears that the quantization scales used in the "first" and "second" times should be <u>first</u> and <u>second</u> quantization scales, respectively, in accordance with claim 8. Since the claim

refers to "the quantization scale" throughout, it is presumed that there is only one quantization scale. Clarification is required.

Also, in claim 6, there is no antecedent basis for "the target cod amount."

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,922,273 by Yonekawa et al. ("Yonekawa").

Regarding claim 1, Yonekawa discloses a dynamic image compression coding apparatus (figure 1) that performs quantization processing and coding processing to a dynamic image signal, wherein the quantization processing is split into two steps of first quantization (fundamental quantization unit 4 - see figure 2A) that performs division using a quantization matrix (column 5, lines 35-66: a 16x16 quantization matrix quantizes each block of coefficients using division) and second quantization (quantization coding unit 7 - see figure 9) that performs division (704-4, figure 9) using a quantization scale (k_s) and, a code amount is controlled by controlling the quantization scale (figure 4(a)-(c) and column 3, lines 59-63: the three types of "quantization interval

determination units" (5, figure 1) control the amount of code by controlling the quantization scale k_s).

Regarding claim 2, Yonekawa discloses a dynamic image compression coding apparatus (figure 1) that performs quantization processing and coding processing to a dynamic image signal, wherein the quantization processing is split into two steps of first quantization (fundamental quantization unit 4 - see figure 2A) that performs division using a quantization matrix (column 5, lines 35-66: a 16x16 quantization matrix quantizes each block of coefficients using division) and second quantization (quantization interval determination unit 7 - see figure 9) that performs division (704-4, figure 9) using a quantization scale (k_s), a storage means (block buffer memory 6, figure 1) that stores a signal after the first quantization between the first quantization and the second quantization is provided, and a code amount is controlled by repeating the second quantization multiple times (figure 4(a)-(c) and column 3, lines 59-63: the three types of "quantization interval determination units" (5, figure 1) control the amount of code by controlling the quantization scale k_s, and the second quantization is repeated for every block in the image).

6. Claims 3-7, 9, 11, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,696,558 by Tsukamoto.

Regarding claims 3, 9, 11, and 12, Tsukamoto discloses a dynamic image compression coding apparatus/method/program (figure 11), comprising means for:

performing first quantization that divides a dynamic image signal using a predetermined quantization matrix (weighting circuit 3 divides the image signal by a predetermined quantization matrix, or "weight" matrix, for each image block - see figure 3);

storing a signal (memory 14 stores a signal that was divided in the first quantization step) divided in the step of performing the first quantization;

performing second quantization (7) that divides, using a quantization scale, the signal divided in the step of the first quantization or a signal stored in the step of performing the storage;

encoding the signal (8) divided in the step of performing the second quantization; and

variably controlling (50) the quantization scale used in the step of performing the second quantization based on a code amount of the output signal of the coding means (i.e. the quantization scale is selected by the selecting circuit based on the output of the coding circuit 8).

Regarding claim 4, Tsukamoto discloses the dynamic image compression coding apparatus according to claim 3, wherein the second quantization means and the coding means operate a plurality of times, and the quantization control means variably controls the quantization scale of the second quantization means based on the code amount of the output signal of the

coding means at each time (i.e. the quantization means and the coding means operate for each coefficient of each block - see figure 12).

Regarding claim 5, Tsukamoto discloses the dynamic image compression coding apparatus according to claim 3, wherein

the storage means outputs the output signal of the first quantization means twice (figure 12: first output for coefficient A1; second output for coefficient A2),

the second quantization means (7) divides the first output signal of the storage means by a first quantization scale (C1: column 10, lines 34-59) and divide the second output signal of the storage means by a second quantization scale (C2: column 11, lines 1-16),

the coding means (8) encodes the output signal of the second quantization means, and

the quantization control means (50) variably controls the second quantization scale (C2) of the second quantization means based on the code amount ("bit number of variable length code": S10, figure 13) of the signal that is divided by the first quantization scale by the second quantization means and encoded by the coding means (column 10, lines 56-67: the number of bits (E1) of the quantized data is used to control C2).

Regarding claim 6, Tsukamoto discloses the dynamic image compression encoding apparatus according to claim 3, wherein

the storage means outputs the output signal of the first quantization means twice (figure 12: first output for coefficient A1; second output for coefficient A2),

in the first time (i.e. for coefficient A1),

the second quantization means (7) divides a one-picture output signal of the storage means every macro block using the quantization scale (i.e. C1 is used to quantize A1 for every block and may or may not be different for every block),

the coding means (8) encodes a one-picture output signal of the second quantization means every macro block, and

the quantization control means (50) calculates a target code amount every macro block based on the code amount ("bit number of variable length code": S10, figure 13) for every macro block of the output signal of the coding means, and

in the second time (i.e. for coefficient A2),

the second quantization means (7) divides the output signal of the storage means for every macro block using the quantization scale (i.e. C2 is used to quantize A2 for every block and may or may not be different for every block),

the coding means (8) encodes the output signal of the second quantization means every macro block, and

the quantization control means (50) compares (S4, figure 13) the code amount for every macro block of the output signal of the coding means with the target code amount (G

→ S4, figure 13) for every the macro block and supply the quantization scale (C2) used by the second quantization means in the second time to the second quantization means.

Regarding claim 7, Tsukamoto discloses a dynamic image compression coding apparatus/method (figure 17), comprising:

a first quantization means (weighting circuit 3 divides the image signal by a predetermined quantization matrix, or "weight" matrix, for each image block - see figure 3) that divides a dynamic image signal that is split (formatting circuit 1 splits the image into blocks) into a plurality of macro blocks using a predetermined quantization matrix;

a storage means (14) that stores a one-picture output signal of the first quantization means;

a second quantization means (7) that divides an output signal of the storage means by a first quantization scale (column 10, lines 34-59: first quantization scale C1 is applied to the first coefficient in each block) for each of the plurality of macro blocks;

a quantization control means (50) that controls the quantization scale of the second quantization means;

a coding means (8) that encodes the output signal of the second quantization means; and

a target code amount decision means (50) that decides a target code amount for each of the plurality of macro blocks that are supplied to the quantization control means based on a code

amount for each of the plurality of macro blocks of the output signal of the coding means (see figure 13: S4-7 → the target code amount (i.e. the number of output bits) for each coefficient and thus for each block is determined based on the code amount of the output of the coding means, as computed in S10), wherein

the second quantization means (7) divides the output signal of the storage means for each of the plurality of macro blocks by the second quantization scale (column 11, lines 1-16: second quantization scale C2 is applied to the second coefficient in each block);

the coding means (8) encodes the output signal of the second quantization [coding] means; and

the quantization control means (50) compares (S4, figure 13) the code amount for each of the plurality of macro blocks of the output signal of the coding means with the target code amount for each of the plurality of macro blocks supplied by the target code amount decision means and control the second quantization scale of the second quantization means based on the comparison result (see figure 13: S5-8).

[Note: Tsukamoto's quantization is performed separately on individual coefficients, rather than strictly on a block-by-block basis. However, determining the quantization scales, target code amounts, etc. for each coefficient of a block essentially determines the quantization parameters for the block. That is, the quantization scale for each coefficient in a

block may or may not be the same, depending on the characteristics of the coefficients in the block. Cf. U.S. 5,656,760 by Ohtsuki (figures 6-7).]

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,654,760 by Ohtsuki in view of Tsukamoto.

Regarding claims 8 and 10, Ohtsuki discloses a dynamic image compression coding apparatus/method (figure 1), comprising:

a second quantization means (102) that divides an output signal using a quantization scale;

a quantization control means (108) that controls the quantization scale of the second quantization means;

a coding means (103) that encodes an output signal of the second quantization means; and

a target code amount decision means (117) that decides a target code amount for each of the macro blocks from a code amount of the output signal of the coding means, wherein

outputting a signal to the second quantization means twice;

in the first time (i.e. for an I-block),

the second quantization means (102) divides a first one-picture output signal for each of the macro blocks using a first quantization scale (column 1, lines 32-35);

the coding means (103) encodes a signal divided using the first quantization scale every the macro block; and

the target code amount decision means (117) decides the target code amount for each of the macro blocks based on a total of the code amount for each of the macro blocks of the signal in which the signal divided using the first quantization scale is encoded and the one-picture code amount (column 1, lines 38-44); and

in the second time (i.e. for a subsequent B or P block),

the second quantization means (102) divides the k-th (k: positive integer of k<n) macro block signal output using a second quantization scale (i.e. the B or P block is quantized using a controlled quantization scale);

the coding means (103) encodes the k-th macro block signal divided using the second quantization scale; and

the quantization control means (108) compares the code amount of the signal in which the k-th macro block signal divided using the second quantization scale is encoded with the target code amount of the k-th macro block and variably control the second quantization scale used by the second quantization means for the division of the (k+1)-th macro block signal based on the comparison result (column 1, lines 38-44: for every macroblock, the actual code amount is compared to the target code amount in order to control the quantization scale of the quantizer).

Ohtsuki does not disclose a first quantization means that divides a one-picture dynamic image signal split into n pieces (n: optional positive integer) of macro blocks using a predetermined quantization matrix; and a storage means that stores a one-picture output signal of the first quantization means.

Tsukamoto discloses an encoding system (figure 11), similar to that of Ohtsuki, wherein a first quantization means (weighting circuit 3 divides the image signal by a predetermined quantization matrix, or "weight" matrix, for each image block - see figure 3) divides a one-picture dynamic image signal split (formatting circuit 1 splits the image into blocks) into n pieces (n: optional positive integer) of macro blocks using a predetermined quantization matrix; and

a storage means (14) that stores a one-picture output signal of the first quantization means for output to subsequent quantization and encoding processes.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include Tsukamoto's weighting circuit 3 and memory 14 in Ohtsuki's system in order to achieve the claimed invention by subjecting the image data to a first quantization process and outputting the result to a memory, since Tsukamoto discloses that quantizing an image by weighting prior to adaptive quantization processing was conventional in the art and the its advantages were well-known by those skilled in the art at the time of the invention (see column 2, lines 20-38).

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,905,578 by Fujii et al. ("Fujii") in view of Tsukamoto.

Regarding claim 13, Fujii discloses a dynamic image compression coding apparatus (figure 1), comprising:

a plurality of estimation-system second quantization means (1306) that divide an output signal using a plurality of different estimation-system quantization scales;

a plurality of estimation-system coding means (1308) that encode the output signal of the plurality of estimation-system second quantization means;

a second quantization means (column 2, lines 45-49) that divides the output signal of the storage means using a quantization scale;

a coding means (column 2, lines 45-49) that encodes the output signal of the second quantization means; and

a quantization control means (1318) that variably controls the quantization scale based on a code amount of the output signal of the plurality of estimation-system coding means.

Fujii does not disclose a first quantization means that divides a dynamic image signal using a predetermined quantization matrix; and a storage means that stores an output signal of the first quantization means.

Tsukamoto discloses an encoding system (figure 11), similar to that of Ohtsuki, wherein a first quantization means (weighting circuit 3 divides the image signal by a predetermined quantization matrix, or "weight" matrix, for each image block - see figure 3) divides a one-picture dynamic image signal split (formatting circuit 1 splits the image into blocks) into n pieces (n: optional positive integer) of macro blocks using a predetermined quantization matrix; and

a storage means (14) that stores a one-picture output signal of the first quantization means for output to subsequent quantization and encoding processes.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include Tsukamoto's weighting circuit 3 and memory 14 in Ohtsuki's system in order to achieve the claimed invention by subjecting the image data to a first quantization process and outputting the result to a memory, since Tsukamoto discloses that quantizing an image by weighting prior to adaptive quantization processing was conventional in the art and the its advantages were well-known by those skilled in the art at the time of the invention (see column 2, lines 20-38).

10. Claims 14 and 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii in view of Tsukamoto, and further in view of U.S. Patent 5,590,064 by Astle.

Regarding claim 14, Fujii discloses the dynamic image compression encoding apparatus according to claim 13, wherein the plurality of different estimation-system quantization scales are the power of 2 respectively (see figure 3).

Fujii does not disclose the plurality of estimation-system second quantization means operate division that, using a bit shift, uses the plurality of different estimation-system quantization scales.

Astle discloses an image processing system that involves quantizing DCT coefficients. In particular, Astle teaches that it is conventional to quantize coefficients by dividing the coefficients and then rounding to the nearest number or truncating the residue. Also, Astle teaches that is it preferred for a quantization scale to conform to powers of two so that the quantizer may be implemented by a simple bit shifter. Column 7, lines 24-38.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use a bit shifter per the teaching of Astle, since Astle discloses that using a bit shifter when the quantization scale is in powers of two is both a conventional and preferred implementation of a quantizer.

Regarding claim 15, Fujii does not disclose the plurality of estimation-system second quantization means round down a residue among the results from which the division is performed using the plurality of different estimation-system quantization scale.

Astle discloses an image processing system that involves quantizing DCT coefficients. In particular, Astle teaches that it is conventional to quantize coefficients by dividing the coefficients and then rounding to the nearest number or truncating the residue. Also, Astle teaches that is it preferred for a quantization scale to conform to powers of two so that the quantizer may be implemented by a simple bit shifter. Column 7, lines 24-38.

It would have been obvious to one of ordinary skill in the art at the time of the invention to truncate the residue per the teaching of Astle, since Astle discloses that truncating the residue during quantization is a conventional technique of quantizing DCT coefficients.

11. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukamoto in view of Ohtsuki, and further in view of U.S. Patent 5,739,865 by Takahashi.

Regarding claim 16, Tsukamoto discloses a dynamic image compression coding recorder (figure 11), comprising:

a DTC conversion means that DTC-converts an image signal (DCT circuit 2);

a first quantization means (weighting circuit 3 divides the image signal by a predetermined quantization matrix, or "weighting") that divides an output signal of the DCT conversion means using a predetermined quantization matrix;

a storage means (14) that stores an output signal of the first quantization means;

a second quantization means (7) that divides the output signal of the storage means using a quantization scale;

a coding means (8) that encodes an output signal of the second quantization means;

a quantization control means (50) that variably controls the quantization scale of the second quantization means based on a code amount of the output signal of the coding means;

a recording means (9) that records an encoded signal.

Tsukamoto does not disclose:

a first A/D converter to which an analog image signal is input and A/D-coverts the input analog image signal;

a motion compensation means that performs motion compensation to an output signal of the first A/D converter;

a DTC conversion means that DTC-converts an output signal of the motion compensation means;

a second A/D converter to which an analog voice signal is input and A/D-converts the input analog voice signal;

a voice compression coding means that compresses and encode an output signal of the second A/D converter;

a multiplexing means that multiplexes the output signal of the coding means and the output signal of the voice compression coding means; and

a recording means that records a signal multiplexed by the multiplexing means.

Ohtsuki discloses an image processing system (figure 2), similar to that of Tsukamoto, which encodes images based on adaptive quantization. In particular, Ohtsuki shows that, conventionally, digital image signals are input to a motion detecting circuit 4 in order to effect

motion compensation of the image using a motion compensating means 13. A motion-compensated signal is then inputted into a DCT transform circuit 1, from which encoding of the DCT-transformed image proceeds.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tsukamoto by Ohtsuki to provide motion compensation means, as claimed, since Ohtsuki shows that motion compensation is conventionally utilized in video codecs, such as MPEG, in order to more efficiently encode the images.

Takahashi discloses an image processing system (figure 1) that employs an A/D converter 9 to convert analog image signals to digital signals.

It would have obvious to incorporate this feature into Tsukamoto's system, since, conventionally, image input devices create analog signals, which must be converted to digital signals in order to effect image processing techniques.

Takahashi also discloses a second A/D converter (3) to which an analog voice signal is input and A/D-converts the input analog voice signal;

a voice compression coding means (7) that compresses and encode an output signal of the second A/D converter;

a multiplexing means (13) that multiplexes the output signal of the (image) coding means (11) and the output signal of the voice compression coding means.

It would have been obvious to modify Tsukamoto by Takahashi to convert, encode, and multiplex a voice signal, as claimed, since Takahashi shows that video data is conventionally accompanied by audio data, as was well-known in the art at the time of the invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (703) 306-3489. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au, can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2600 Customer Service Office whose telephone number is (703) 306-0377.

CML
Group Art Unit 2623
29 September 2004

VIKKRAM BALI
PRIMARY EXAMINER